Patent Claims

1. Device for detecting one or more analytes in a sample, characterised in that it includes one or more reaction chamber(s) (1), and/or one or more reagent application channel(s) (2), and one or more capillary system(s) (3) and one or more negative vessel(s) (4).

2. Device according to claim 1, wherein a capillary system (3) includes at least one capillary (3b) of a capillary plane (3a) or one or more capillaries (3b), which present a diminished cross-section in one or more capillary planes (3a).

3. Device according to claim 1 or 2, wherein the capillary system (3) includes capillary planes (3a) of diminishing cross-section, which are disposed one below the other.

4. Device according to any one of claims 1 to 3, wherein in each capillary plane (3b) a plurality of capillaries (3b) are arranged in an adjoining or bundled fashion.

5. Device according to any one of claims 1 to 4, wherein adjoining or bundled capillaries (3b) of a capillary plane (3a) include connecting webs (8).

6. Device according to any one of claims 1 to 5, wherein adjoining or bundled capillaries (3b) of a capillary plane (3a) have the same inner cross-sectional area.

7. Device according to any one of claims 1 to 6, wherein, the more distant the inner cross-sectional area of the capillary planes (3a) is disposed from the reaction chamber (1), the smaller it becomes.

8. Device according to any one of claims 1 to 7, wherein the capillary planes (3a) of the capillary system (3) are connected by chambers, whose inner cross-sectional area is preferably the same as that of the largest capillary (3b).

9. Device according to any one of claims 1 to 8, wherein the reagent application channel (2) has 1,2 times the volume compared with the capillary (3b) or the capillary system (3) plus negative vessel (4).

10. Device according to any one of claims 1 to 9, wherein the negative vessel (4) has a larger volume than the volume of the compacted sediment of the cells or particles used.

11. Device according to any one of claims 1 to 10, wherein the negative vessel (4) has a shape, which tapers towards the bottom, for example pointed like an arrow or U-shaped.

12. Device according to any one of claims 1 to 11, from which one or a plurality of ventilation channel(s) (6) branches/branch off, preferably from the upper, wider portion of the negative vessel.

13. Device according to any one of claims 1 to 12, wherein the capillary system (3) forms an integral component of the carrier element (5).

14. Method for detecting one or more analytes in a sample fluid by the visualisation of agglutination, characterised in that

a) the sample fluid is brought into contact with a reagent,

b) the reaction mixture is exposed to the effects of gravitation or magnetism, the reaction mixture passing through the

capillary system of the device according to one of claims 1 to 13, followed by a negative vessel of the device according to one of claims 1 to 13

and

c) the reaction between the analyte and the reagent is determined.

15. Method according to claim 14, wherein the reaction mixture is brought into contact with a further reagent during process step b).

16. Method according to claim 14, wherein the order of the individual process steps consisting of a) and b) are reversed, in particular when the sample fluid is brought into contact with a reagent only during the action of gravitation or magnetism.

17. Method according to any one of claims 14 to 16, wherein the sample fluid and/or the reagent include one or more particles.

18. Method according to any one of claims 14 to 17, wherein the reaction is determined optically.

19. Method according to any one of claims 14 to 18, wherein the particles have a natural colour or are coloured.

20. Method according to any one of claims 14 to 19, wherein the particles are colour-, radio-, fluorescent- or enzyme-coded.

21. Method according to any one of claims 14 to 20, wherein the particles include erythrocytes and/or thrombocytes and/or leucocytes or parts thereof.

22. Method according to any one of claims 14 to 21, wherein the particles are pre-treated with proteolytic enzymes in order to enhance the reaction.

23. Method according to any one of claims 14 to 22, wherein antibodies, in particular peptides, proteins, carbohydrates, lipids, nucleic acids, viruses, bacteria, parasites, human cells, animal cells or plant cells or parts thereof are bound to the particles.

24. Method according to any one of claims 14 to 23, wherein antigens or other ligands, such as, e.g. peptides, proteins, carbohydrates, lipids, nucleic acids, viruses, bacteria, parasites, human cells, animal cells, plant cells or allergens or parts thereof are bound to the particles.

25. Method according to any one of claims 14 to 24, wherein the particles in particular comprise polystyrene, polybromostyrene, gelatine, melamine, polymerised agarose or polymethyl methacrylate.

26. Method according to any one of claims 14 to 25, wherein the particles are magnetic or paramagnetic.

27. Method according to any one of claims 14 to 26, wherein the sample mixture is exposed to gravitation by being subjected to centrifuging.

28. Method according to any one of claims 14 to 27, wherein the sample mixture is exposed to magnetism.

29. Method according to any one of claims 14 to 28, wherein the sample fluid comprises human, animal or plant material, in particular blood or blood components.

30. Method according to any one of claims 14 to 29, wherein the reagent comprises in particular antibodies, test cells, synthetic particles, buffers or booster solutions.

31. Method according to any one of claims 14 to 30, wherein glycerine or other molecules are added to the reagent in order to increase the specific density of the solution.

32. Use of the device according to an one of claims 1 to 13, in particular in blood group serological diagnostics, preferably for determining blood groups, antibodies against blood group characteristics, of compatibilities between stored blood and recipients, for determining thrombocyte characteristics and antibodies directed against thrombocytes, for determining leucocyte characteristics and antibodies directed against leucocytes, for detecting haemagglutinating viruses, for detecting antibodies against proteins, viruses, bacteria, parasites, for detecting viral or bacterial or parasitic or other antigens and/or for detecting auto-antibodies and antibodies directed against allergens.